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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

FOREST INSECT SURVEYS - MODOC NATIONAL FOREST

Season of 1937

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by
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Berkeley, California
March 11, 1938

Annex I
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Forest Insect Laboratory
Berkeley, California
March 11, 1938

FOREST INSECT SURVEYS - MODOC NATIONAL FOREST

Season of 1937.

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FOREST INSECT SURVEYS - MODOC NATIONAL FOREST

Season of 1937

INTRODUCTION

The 1937 insect loss survey of the Modoc National Forest was conducted by the Bureau of Entomology and Plant Quarantine during the period from October 28 to November 18. This survey was confined to a series of thirteen 320 acre plots in the Happy Camp-Lava Beds area. (See Map) Plot RS-11, located in the Warner Mountains, will not be cruised until the spring of 1938. Data obtained from these plots (Table I) form the basis of the loss estimates for the area (Table II).

GENERAL INFESTATION CONDITIONS

Characteristics:

At the present time, losses generally are low over the Modoc area as a whole, and no centers of vigorous infestation exist Completion of the 1936 loss record substantiated the indication that there was a return to normal infestation conditions. During 1937 there was, in general, a further reduction in losses on the better sites. On the poorer sites both reductions and increases in the amount of loss were recorded. It is felt that certainly on the poorer sites, such as in parts of the Glass Mountain unit, losses reached a minimum low point during the 1937 season. On the better sites the minimum has probably very nearly been reached. In many respects current infestation conditions are similar to those of the 1930 season.

Composition of Infestation:

Accompanying the reduction in losses has been an increase in the importance of the role played by the California Flatheaded Borer. In 1936 flatheads initiated attack in 26 per cent of the trees as compared with 56 per cent for the Western Pine Beetle. In 1937 these percentages changed to 85.2 and 2.5 respectively. The influence of extremely low temperatures during January, 1937, causing a heavy mortality of Western Pine Beetle broods, undoubtedly was an important factor in this significant change. The relative importance of the two species must be considered in estimating current season losses since flathead trees generally fade later than do D. b. trees.

Forecasts:

In 1935 verbal predictions were made at the start of the season that peak infestations and the grouping stage of the infestation cycle would be reached in that year. In 1936 verbal predictions were

made that a marked decrease in insect activity and in the amount of loss would occur in that season. In May, 1937, a forecast was made as follows: (1)

"Modoc National Forest:

A continued decline in volume losses, at least during the first part of the season. This is to be correlated with weak western pine beetle infestations and an increase in topkilling activity by flatheaded borers. During the latter half of the season, the downward trend should be checked - the total loss for the 1937 season probably being lower than that for 1936. Flatheads will extend farther down in infested trees and will play a more predominant role in the 1937-38 overwintering infestations than in that of 1936-37."

These successful predictions were made on the basis of seven years of study of the changes in roles of species and of seasonal differences in the composition of infestations. It is believed these studies provide a basis for forecasting the infestation trend. Analyses of infested trees made in the fall of 1937, prompt the following forecast for 1938, this forecast being the joint opinion of Bureau personnel associated with eastside projects:

Insect caused losses will remain fairly low, or with some increase during the latter part of the season, particularly on the poorer sites. It is expected that the western pine beetle, now at an extremely low ebb, will regain a more important place in the infestation. While losses will remain fairly low, the stage will probably be set for subsequent marked increases and epidemic infestations. The time of occurrence of those conditions will depend largely upon future climatic and host conditions and on the degree of success of flathead broods initiating attacks in green trees.

Recommendations:

Because of the endemic type of infestation, no recommendations are being made for direct control. However, as has been stated in previous reports on surveys of the Modoc, the Bureau holds the view that since the stands are for the most part composed of overmature, susceptible trees, some form of management should be applied which would bring about a change in this stand condition.

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(1) Memorandum for the Files:
Re: Forecast of 1937 Infestation Conditions. Modoc and Lassen N.F.
K. A. Salman. May 27, 1937.

LOSSES IN CUTOVER STANDS

During 1936 a second cutover plot was established in the Glass Mountain Unit which is now more than 50 percent cutover. The loss records for the two plots, on a per acre basis, are as follows:

Plot CO-5

Year	Trees per Acre	B.M. per Acre
1934	.08	12.9
1935	.12	19.5
1936	.06	9.5
1937 (est)	.03	3.0

Plot CO-26

1936	.15	32.5
1937 (est)	.07	5.8

Since these two plots sample different conditions, they cannot well be averaged to indicate the loss for the cutover area as a whole. On CO-5 the loss for the four year period is approximately half the increment for that period. This condition is in marked contrast to the ratio of loss to increment in virgin stands.

TABLE I.

PLOT LOSSES - MODOC NATIONAL FOREST

PER SECTION BASIS

Plot	Timbered acreage	1935 Trees	1935 B.M.volume	1935 B.M.per acre	1934 loss	1936 Trees	1936 B.M.volume	1936 B.M.per acre	1935 loss	1937 (Estimated) Trees	1937 (Estimated) B.M.volume	1937 (Estimated) B.M.per acre	1936 loss
RS-1	289	334	235,760	368	72.4	126	118,380	185	50.3	47	63,000	98	53.0
RS-2	320	618	463,220	724	143.9	110	68,180	107	14.8	22	41,800	65	60.7
RS-3	298	178	132,280	207	62.3	36	43,080	67	32.4	9	11,000	17	25.4
RS-4	314	336	164,840	258	55.1	CUTOVER, SPRING, 1936							
RS-5	300	256	167,240	261	101.6	84	76,920	120	46.0	44	63,500	99	82.5
RS-6	307	118	112,700	176	97.2	92	55,860	87	49.4	34	40,000	63	72.4
RS-11	314	88	104,000	163	63.2	57	58,130	91	55.8	(Estimated for 1936)			
MC-1	320	310	184,360	288	147.7	72	50,740	79	27.4	36	41,000	64	81.0
MC-2	278	340	282,020	441	111.6	112	122,240	191	43.3	51	58,300	91	47.6
MC-3	300	280	279,060	436	44.7	142	141,520	221	50.7	170	224,000	350	158.4
MC-5	261	86	58,160	91	100.0	30	19,560	31	34.1	27	26,800	42	135.5
MC-6	316	244	233,200	364	120.1	50	28,680	45	12.4	37	46,000	72	160.0
MC-7	301	270	188,320	294	124.1	64	70,760	111	37.8	29	39,200	61.	55.0
MC-8	320	314	191,700	300	68.4	124	88,300	138	46.0	15	25,000	39	28.3
MC-10	300	56	81,460	127	60.2	56	45,500	71	55.9	13	47,000	73	102.8
Averages				283	78.2			112	38.9			87	79.1

TABLE II.

LOSS ON VIRGIN STANDS - MODOC NATIONAL FOREST

PER UNIT BASIS

Unit	1935 Loss			1936 Loss			1937 Loss (Estimated)		
	Timbered acreage	No. trees	MBM vol.	Timbered acreage	No. trees	MBM vol.	Timbered acreage	No. trees	MBM vol.
Glass Mt.	46,374	16,231	10,053	38,385	7,293	5,577	32,625	3,263	3,178
Badger	85,185	34,074	27,455	85,185	11,926	10,997	85,185	7,667	9,907
Happy Camp	62,887	31,444	22,589	59,962	7,195	5,678	59,322	2,966	3,559
Lava Beds	78,033	24,190	17,604	77,697	12,432	8,438	76,097	6,088	4,946
Pit River	31,720	10,150	6,090	31,720	5,392	3,775	31,240	2,187	2,499
Timber Mt.	1,600	1,920	506	1,600	480	144	1,600	960	322
Totals	305,799	118,009	84,297	294,549	43,567	34,609	286,069	21,491	24,316

LAVA BED

NATIONAL MONUMENT

T. 45 N.

R.5E. R.6E. R.7E. R.9E

40'

T. 44 N.

TIMBER MT.

GLASS MOUNTAIN

CO-26

CO-5

MC-3

RS-5

MC-7

BADGER

MC-6

MC-5

RS-1

MC-2

TO MT SHASTA

T. 43 N.

R. 3 E.

30'

BURNT LAVA FLOW

LAVA BEDS

MC-8

PIT RIVER

RS-3

MC-1

T. 42 N.

HAPPY CAMP

RS-2

T. 41 N.

RS-6

MC-10

TO MT SHASTA

20'

WHITE HORSE

T. 40 N.

OLD LAVA

N. F.

FLOW

T. 39 N.

WATER HOLE

SISKIYOU CO.

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REGIONAL SURVEYS

MODOC NATIONAL FOREST, CALIFORNIA

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SAMPLE PLOT; VIRGIN STAND
SAMPLE PLOT; CUTOVER STAND
CUTOVER LAND AS OF JAN. 1, 1938

J.H. FISKE

APPENDIX

BASIS OF ESTIMATES

1937 Plot Losses:

Plot	Percent Cruised
RS-1	77
RS-2	91
RS-3	92
RS-5	86
RS-6	93
MC-1	79
MC-2	78
MC-3	71
MC-5	74
MC-6	91
MC-7	82
MC-8	92
MC-10	94

Unit Losses

	1936	1937
Glass Mt.	55% 1935 # trees 67% " B.M.	55% 1936 # trees 67% " B.M.
Badger	Aver. RS-1,5; MC-2,3,5,6,7	Aver. RS-1,5; MC-2,3,5,6,7
Happy Camp	$\frac{(RS\text{-}2x1, RS\text{-}3x2, MC\text{-}8x1)}{4}$	$\frac{RS\text{-}2x1, RS\text{-}3x1, MC\text{-}8x1}{2}$ for B.M. (#trees - 1200 $\frac{B.M}{TREE}$
Lava Beds	RS-6, MC-10 + 2) / MC-8) + 2	B.M. -60% 1936 Trees - 50% 1936
Pit River	$MC\text{-}1x\frac{3}{2}$	$MC\text{-}1 \times \frac{5}{4}$
Timber Mt.	Cut and Uncut Plots	Cut and Uncut Plots

LOSS ON VIRGIN STANDS - PER ACRE BASIS

Unit	No. trees	BM vol.	No. trees	BM vol.	No. trees	BM vol.
Glass Mt.	.35	216.8	.19	145.3	.10	97.4
Badger	.40	322.3	.14	129.1	.09	116.3
Happy Camp	.50	359.8	.12	94.7	.05	60.0
Lava Beds	.31	225.6	.16	108.6	.08	65.0
Pit River	.32	192.0	.17	119.0	.07	80.0
Timber Mt.	1.20	316.0	.30	90.0	.60	201.0